Remarks

This is in response to the Office Action mailed on April 26, 2002, in which claim 5 was rejected under 35 U.S.C. § 112, second paragraph; claims 1-3, 5, 6, and 22 were rejected under 35 U.S.C. § 102(b); and claims 4, 7, and 8 were rejected under 35 U.S.C. § 103(a). With this amendment, claim 1 has been amended, support for which can be found at page 7, lines 27-34 and Fig. 1B of the present application. Claims 2-4 have been amended to be consistent with claim 1. New claim 23 has been added, support for which is found in claim 1. Claim 5 has been amended to depend from claim 23. Claims 1-8, 22, and 23 remain pending in the application. Reconsideration and allowance of all pending claims are respectfully requested.

As requested by the Examiner in the final Office Action mailed on April 26, 2002, Applicants are submitting herewith Figures 11A and 11B as corrected in the Amendment filed on January 11, 2002 and approved by the Examiner.

I. Claim Rejections Under 35 U.S.C. § 112

In section 2 of the Office Action, the Examiner rejected claim 5 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the rejection states that the term "substance" in claim 5 is indefinite because it is unclear as to which substance the term is referencing. Claim 5 depends from claim 23. Claim 23 recites that a substance in at least one form selected from the group consisting of atoms, molecules, clusters, ions and radicals is added to the substrate in the region. Applicants respectfully suggest that the term "substance" in claim 5 is sufficiently definite as to what the term is referencing. Reconsideration and allowance of claim 5 are respectfully requested.

II. Claim Rejections Under 35 U.S.C. § 102

In section 4 of the Office Action, claims 1-3, 5, 6, and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,426,340 to Higaki et al. Applicants respectfully traverse this rejection. Claim 1 recites that the piezoelectric substrate includes, in the surface between the first and second interdigital transducers, a region having lower resistance than a resistance of an inner portion of the piezoelectric substrate. Such a configuration is shown, for example, in Fig. 1B, wherein a region 11a is formed in the surface between two interdigital

electrodes 12a and 12b. The resistance of the region 11a is lowered by doping (i.e. adding a substance to the substrate).

Higaki includes a piezoelectric layer 4 that is formed of ZnO. Higaki discloses that grounding electrodes 3 having a lower resistance than that of the piezoelectric layer 4 can be formed by doping a metal element into the piezoelectric layer 4. *See* column 7, line 62 to column 8, line 7 and column 10, lines 58-59 of Higaki. As shown in Fig. 8 of Higaki, the grounding electrodes 3 are not formed in the surface on which the interdigital transducers 5 are formed.

Higaki does not disclose a region as recited by claim 1. The region recited in claim 1 has a lower resistance than that of the substrate itself. When high voltage is applied between the two interdigital transducer electrodes, small current flows through the region, thereby preventing the interdigital electrodes from being damaged. Therefore, for at least these reasons, Higaki fails to anticipate claim 1. Reconsideration and allowance of claim 1, as well as claims 2, 3, 5, 6, and 23 that depend therefrom, are respectfully requested.

Regarding claim 22, the substrate recited includes a plurality of conductive regions spaced apart from each other on a surface thereof between the first and second interdigital transducers. Claim 22 recites that a tunnel current flows between the first and second interdigital transducers via the conductive regions.

The rejection asserts that Figure 1 of Higaki discloses a plurality of conductive regions 11 between first and second transducers and that current flows between the first and second transducers via the conductive regions. Applicants respectfully traverse this interpretation of Higaki. In the surface acoustic wave device disclosed by Higaki, an electrical signal is transmitted from a first interdigital transducer 43 to a second interdigital transducer 43 in the form of a mechanical signal (i.e., a surface acoustic wave). *See* column 1, lines 20-38 of Higaki. Therefore, the signal in Higaki is a mechanical signal, not a current.

Conversely, claim 22 recites that a tunnel current flows between the first and second interdigital transducers via the conductive regions. Higaki fails to disclose or suggest a tunnel current flowing between interdigital transducers via a conductive region. Therefore, for at least this reason, Higaki fails to anticipate claim 22. Reconsideration and allowance of claim 22 are respectfully requested.

III. Claim Rejections Under 35 U.S.C. § 103

In section 6 of the Office Action, claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Higaki in view of U.S. Patent No. 5,923,231 to Ohkubo et al. In addition, in section 7 of the Office Action, claims 4 and 7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Higaki in view of ordinary skill in the art. Applicants respectfully traverse both of these rejections under 35 U.S.C. § 103(a) and do not concede the correctness of the rejections' positions on the features of claims 4, 7 and 8. For at least the same reasons as presented with respect to claim 1 above, claims 4, 7, and 8, all of which depend from claim 1, should also be allowable over Higaki. Reconsideration and allowance of claims 4, 7, and 8 are respectfully requested.

IV. Conclusion

In view of the above amendments and remarks, claims 1-8, 22, and 23 should be in condition for allowance. Reconsideration and allowance of all pending claims are respectfully requested. If the Examiner should feel that an interview would be beneficial in moving this case into condition for allowance, the Examiner is encouraged to contact the undersigned attorney at 612.371.5237.

Respectfully submitted,
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